

Amendments to the Claims

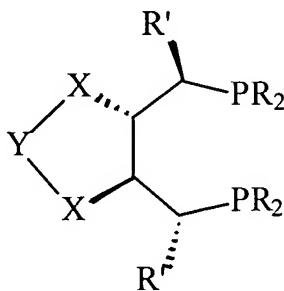
This listing will replace all prior versions and listings of claims in the application:

Listing of Claims

Claims 32-54 (canceled)

The following new claims are added:

-- 55. (new) A catalyst prepared by a process comprising: contacting a transition metal salt, a complex thereof or a transition metal complex, and a ligand selected from compounds represented by formula II or its enantiomer:



II

wherein R' is selected from the group consisting of: alkyl, aryl, substituted alkyl and substituted aryl;

wherein each X is O;

wherein each Y is independently selected from the group consisting of: a diol protecting group residue, C(OR)₂, CH(OR), CH₂, CHR and CR₂; and

wherein each R is independently selected from the group consisting of: alkyl, aryl, substituted alkyl, substituted aryl, fluoroalkyl and perfluoroalkyl.

56. (new) The catalyst of claim 55, having an optical purity of at least 85% ee.

57. (new) The catalyst of claim 55, having an optical purity of at least 95% ee.

58. (new) The catalyst of claim 55, wherein said transition metal is selected from the group consisting of:

Pt, Pd, Rh, Ru, Ir, Cu, Ni, Mo, Ti, V, Re and Mn.

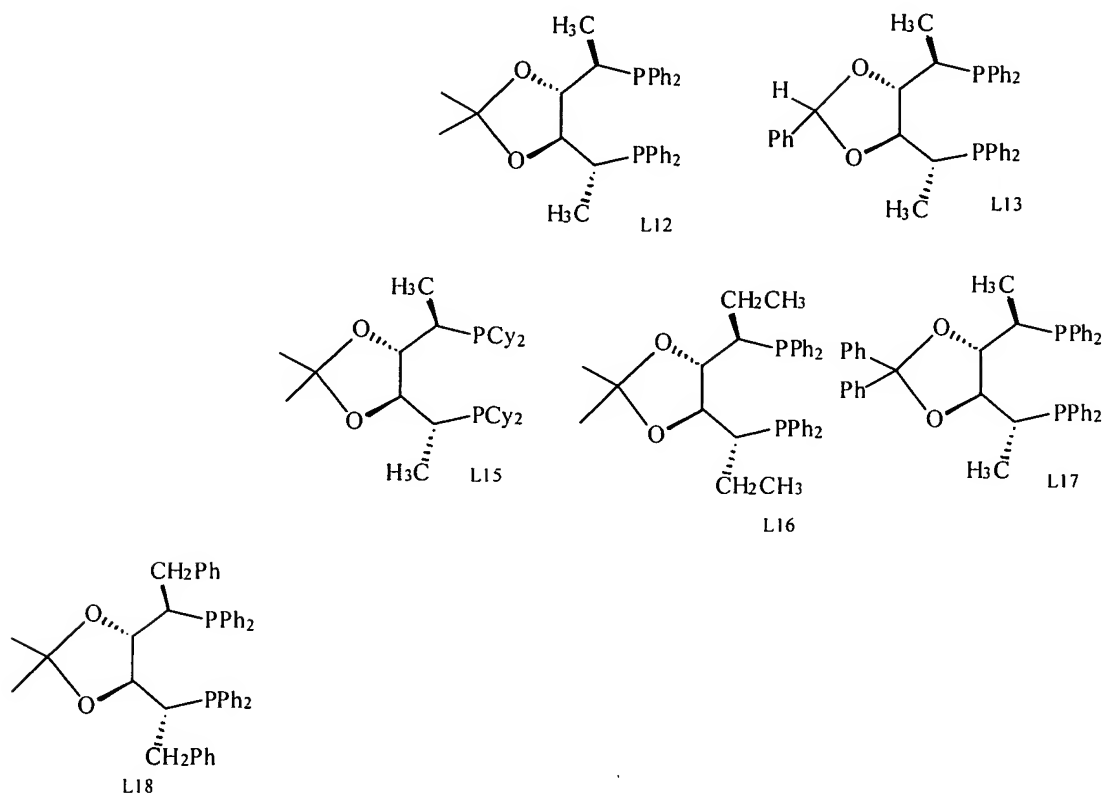
59. (New) The catalyst of claim 58, wherein said transition metal salt, complex thereof, or transition metal complex is selected from the group consisting of:

PtCl₂; Pd₂(DBA)₃; Pd(OAc)₂; PdCl₂(RCN)₂; (Pd(allyl)Cl)₂; (Rh(COD)Cl)₂; (Rh(COD)₂)X; Rh(acac)(CO)₂; Rh(ethylene)₂(acac); Rh(CO)₂Cl₂; Ru(RCOO)₂(diphosphine); Ru(methylallyl)₂(diphosphine); Ru(aryl group)X₂(diphosphine); RuCl₂(COD); (Rh(COD)₂)X; RuX₂(diphosphine); RuCl₂(=CHR)(PR'₃)₂; Ru(ArH)Cl₂; Ru(COD)(methylallyl)₂; (Ir(COD)₂Cl)₂; (Ir(COD)₂)X; Cu(OTf); Cu(OTf)₂; Cu(Ar)X; CuX; NiX₂; Ni(COD)₂; MoO₂(acac)₂; Ti(OiPr)₄; VO(acac)₂; MeReO₃; MnX₂ and Mn(acac)₂; wherein each R and R' is independently selected from the group consisting of: alkyl or aryl; Ar is an aryl group; and X is a counteranion.

60. (new) The catalyst of claim 59, wherein said counteranion X is selected from the group consisting of: halogen, BF₄[−], B(Ar)₄[−] wherein Ar is 3,5-di-trifluoromethyl-1-phenyl, ClO₄[−], SbF₆[−], CF₃SO₃[−], RCOO[−] and a mixture thereof.

61. (new) The catalyst of claim 55, prepared in situ or as an isolated compound.

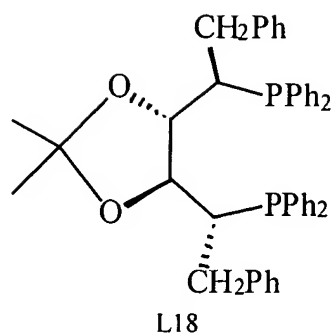
62. (new) The catalyst of claim 55, wherein said ligand is selected from the group consisting of compounds represented by the formula:



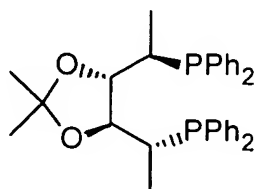
wherein Cy is cyclohexyl group.

63. (new) The catalyst of claim 62, wherein said catalyst is a Rh complex of said ligands.

64. (new) The catalyst of claim 55, wherein said catalyst is a Rh complex of ligand L₁₈ represented by the formula:



65. (new) A catalyst prepared by a process comprising: contacting a transition metal salt, a complex of said transition metal salt, or a transition metal complex, and an (R,S,S,R)-DIOP* ligand represented by the formula:



(R,S,S,R)-DIOP*

66. (new) The catalyst of claim 65, wherein said transition metal is selected from the group consisting of:

Pt, Pd, Rh, Ru, Ir, Cu, Ni, Mo, Ti, V, Re and Mn.

67. (New) The catalyst of claim 66, wherein said transition metal salt, complex thereof, or transition metal complex is selected from the group consisting of:

PtCl₂; Pd₂(DBA)₃; Pd(OAc)₂; PdCl₂(RCN)₂; (Pd(allyl)Cl)₂; (Rh(COD)Cl)₂; (Rh(COD)₂)X; Rh(acac)(CO)₂; Rh(ethylene)₂(acac); Rh(CO)₂Cl₂; Ru(RCOO)₂(diphosphine); Ru(methylallyl)₂(diphosphine); Ru(aryl group)X₂(diphosphine); RuCl₂(COD); (Rh(COD)₂)X; RuX₂(diphosphine);

$\text{RuCl}_2(\text{=CHR})(\text{PR}'_3)_2$; $\text{Ru}(\text{ArH})\text{Cl}_2$; $\text{Ru}(\text{COD})(\text{methylallyl})_2$; $(\text{Ir}(\text{COD})_2\text{Cl})_2$; $(\text{Ir}(\text{COD})_2)\text{X}$; $\text{Cu}(\text{OTf})$; $\text{Cu}(\text{OTf})_2$; $\text{Cu}(\text{Ar})\text{X}$; CuX ; NiX_2 ; $\text{Ni}(\text{COD})_2$; $\text{MoO}_2(\text{acac})_2$; $\text{Ti}(\text{OiPr})_4$; $\text{VO}(\text{acac})_2$; MeReO_3 ; MnX_2 and $\text{Mn}(\text{acac})_2$; wherein each R and R' is independently selected from the group consisting of: alkyl or aryl; Ar is an aryl group; and X is a counteranion.

68. (new) The catalyst of claim 67, wherein said counteranion X is selected from the group consisting of:

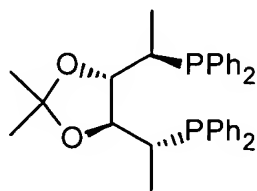
halogen[⊖], BF_4^{\ominus} , $\text{B}(\text{Ar})_4^{\ominus}$ wherein Ar is 3,5-di-trifluoromethyl-1-phenyl, ClO_4^{\ominus} , SbF_6^{\ominus} , $\text{CF}_3\text{SO}_3^{\ominus}$, RCOO^{\ominus} and a mixture thereof.

69. (new) The catalyst of claim 65, prepared in situ or as an isolated compound.

70. (new) The catalyst of claim 65, wherein said catalyst is an Rh complex of (R,S,S,R)-DIOP*.

71. (new) The catalyst of claim 65, wherein said catalyst is an Ru complex of (R,S,S,R)-DIOP*.

72. (new) A catalyst prepared by a process comprising: contacting a rhodium salt, a complex of said rhodium salt or a complex of rhodium, and an (R,S,S,R)-DIOP* ligand represented by the formula:



(R,S,S,R)-DIOP*